

**IN THE CLAIMS:**

The text of all pending claims, (including withdrawn claims) is set forth below. Cancelled and not entered claims are indicated with claim number and status only. The claims as listed below show added text with underlining and deleted text with ~~strikethrough~~. The status of each claim is indicated with one of (original), (currently amended), (cancelled), (withdrawn), (new), (previously presented), or (not entered).

Please AMEND claims 1-5, 7-24, 26-33 and 35-36, and ADD new claims 37-39 in accordance with the following:

1. (currently amended) A resin evaluation method ~~of using~~ an injection molding machine comprising:
  - ~~setting analysis conditions including an injection velocity and a resin temperature;~~
  - ~~performing injections of resin using the injection molding machine on the set analysis conditions; and~~
  - performing a first predetermined number of air shot injections of molten resin with constant injection velocity and different values of resin temperature automatically altered successively for the respective air shot injections, and with resin pressure and injection screw position, or resin pressure and injection time elapsed from start of the injection as the injection screw is advanced, being measured for the respective air shot injections;
  - performing a second predetermined number of air shot injections of molten resin with constant resin temperature and different values of injection velocity automatically altered successively for the respective air shot injections, and with resin pressure and injection screw position, or resin pressure and injection time elapsed from start of the injection as the injection screw is advanced, being measured for the respective air shot injections; and
  - evaluating characteristics of the molten resin by automatically obtaining at least one of a degree of resin-temperature dependency of a variation of the resin pressure in the air shot injections, and a degree of velocity or flow-rate dependency of a variation of the resin pressure in the air shot injections, based on either a relationship between the resin pressure and a the screw position or a relationship between the resin pressure and an elapsing time from a start of each of said injections of resin the injection time, measured in the air shot injections, wherein the degree of resin-temperature dependency of a resin pressure obtains a dependency relation according to an exponential function of the resin temperature and/or the degree of velocity or flow-rate dependency of a resin pressure obtains a dependency relation according to an equation expressing the resin pressure using a power function of the injection velocity or the flow

rate of resin.

2. (currently amended) A resin evaluation method ~~for using~~ an injection molding machine according to claim 1, wherein the resin pressure is detected by a pressure sensor for detecting resin pressure at a nozzle of the injection molding machine or a pressure sensor for detecting resin pressure applied to the screw.

3. (currently amended) A resin evaluation method ~~for using~~ an injection molding machine according to claim 1, wherein the relationship between the resin pressure and the screw position or the ~~elapsing~~ injection time elapsed from a start of each injection are expressed by the resin pressure at set screw positions or the resin pressure at set points in time elapsing from a start of each injection.

4. (currently amended) A resin evaluation method ~~for using~~ an injection molding machine according to claim 1, wherein the resin temperature ~~condition~~ is represented by a nozzle temperature or a cylinder temperature.

5. (currently amended) A resin evaluation method ~~of using~~ an injection molding machine comprising:

~~setting analysis conditions including an injection velocity and a resin temperature;~~  
~~performing injections of resin using the injection molding machine on the set analysis conditions; and~~

performing a first predetermined number of air shot injections of molten resin with constant injection velocity and different values of resin temperature automatically altered successively for the respective air shot injections, and with resin pressure and injection screw position, or resin pressure and injection time elapsed from start of the injection as the injection screw is advanced, being measured for the respective air shot injections;

performing a second predetermined number of air shot injections of molten resin with constant resin temperature and different values of injection velocity automatically altered successively for the respective air shot injections, and with resin pressure and injection screw position, or resin pressure and injection time elapsed from start of the injection as the injection screw is advanced, being measured for the respective air shot injections; and

evaluating characteristics of the molten resin by automatically obtaining an interdependency relation of variation of the resin pressure in the air shot injections with respect

to the resin temperature and an injection velocity or a flow rate of resin, based on either a relationship between the resin pressure and a the screw position or a relationship between the resin pressure and an elapsing time from a start of the injections of resin the injection time measured in the air shot injections, ~~wherein said interdependency relation is obtained according to an equation expressing the resin pressure using a power function of the injection velocity or the flow rate of resin, and an exponential function of the resin temperature.~~

6. (cancelled)

7. (currently amended) A resin evaluation method ~~for using~~ an injection molding machine according to ~~claim 5~~ claim 37, wherein a degree of resin temperature dependency of the resin pressure and a degree of velocity or flow rate dependency of the resin pressure are obtained based on said equation.

8. (currently amended) A resin evaluation method ~~for using~~ an injection molding machine according to claim 5, wherein the resin pressure is detected by a pressure sensor for detecting resin pressure at a nozzle of the injection molding machine or a pressure sensor for detecting resin pressure applied to the screw.

9. (currently amended) A resin evaluation method ~~for using~~ an injection molding machine according to claim 5, wherein the relationship between the resin pressure and the screw position or the relationship between the resin pressure and the elapsing injection time elapsed from a start of injection are expressed by the resin pressure at set screw positions or the resin pressure at set points in time elapsing from a start of injection.

10. (currently amended) A resin evaluation method ~~for using~~ an injection molding machine according to claim 5, wherein the resin temperature ~~condition~~ is represented by a nozzle temperature or a cylinder temperature.

11. (currently amended) A resin evaluation method ~~for using~~ an injection molding machine comprising:

performing a predetermined times number of air shot injections of molten resin in which ~~the a~~ resin temperature is automatically successively altered, and in which ~~the an~~ injection velocity is also automatically successively altered in accordance with the successive alterations

of the temperature;

detecting an injection pressure in each of the air shot injections;

obtaining data of the injection pressure, the injection velocity and the resin temperature in each of the injections; and

evaluating characteristics of the molten resin by automatically obtaining an interdependency relation of variation of the resin pressure in the air shot injections with respect to the resin temperature and the injection velocity or flow rate of resin based on combinations of the data of the injection pressure, the injection velocity and the resin temperature in the injections, ~~wherein said interdependency relation is obtained according to an equation expressing the resin pressure using a power function of the injection velocity or the flow rate of resin, and an exponential function of the resin temperature.~~

12. (currently amended) A resin evaluation method ~~for~~ using an injection molding machine according to claim 11, wherein ~~the~~ a screw position and the injection pressure are detected at every predetermined period in each of the air shot injections, and the interdependency relation is automatically obtained as a function of the screw position or an elapsing injection time elapsed from a start of each injection.

13. (currently amended) A resin evaluation method ~~for~~ using an injection molding machine according to claim 11, wherein the injection pressure is detected at set positions or set points in time elapsing from a start of injection in each of the injections, and the data of the injection pressure, the injection velocity and the resin temperature are obtained in each of the ~~injection~~ injections.

14. (currently amended) A resin evaluation method ~~for~~ using an injection molding machine according to claim 11, wherein said air shot injection comprises an air shot of injecting resin in air without a mold attached to the injection molding machine.

15. (currently amended) A resin evaluation method ~~for~~ using an injection molding machine according to claim 11, wherein the ~~resin injection~~ pressure is detected by a pressure sensor for detecting resin pressure at a nozzle of the injection molding machine or a pressure sensor for detecting resin pressure applied to the screw.

16. (currently amended) A resin evaluation method ~~for~~ using an injection molding

machine according to claim 11, wherein the resin temperature-condition is represented by a nozzle temperature or a cylinder temperature.

17. (currently amended) A resin evaluation device using an injection molding machine comprising:

~~setting means for setting analysis conditions including an injection velocity and a resin temperature to evaluate characteristics of resin;~~

~~detecting means for detecting a resin pressure at set screw positions or set points in time elapsing from a start of the injections under the set analysis conditions; and~~

one or more nozzles through which a first predetermined number of air shot injections of molten resin are performed with constant injection velocity and different values of resin temperature automatically altered successively for the respective air shot injections, and with resin pressure and injection screw position, or resin pressure and injection time elapsed from start of the injection as the injection screw is advanced, being measured for the respective air shot injections, and through which a second predetermined number of air shot injections of molten resin are performed with constant resin temperature and different values of injection velocity automatically altered successively for the respective air shot injections, and with resin pressure and injection screw position, or resin pressure and injection time elapsed from start of the injection as the screw is advanced, being measured for the respective air shot injections; and

analyzing means for an analyzer to evaluate characteristics of the molten resin by automatically obtaining at least one of a degree of resin temperature dependency of variation of the resin pressure in the air shot injections and a degree of the injection velocity or flow rate dependency of variation of the resin pressure in the air shot injections based on the detected resin pressure, the injection velocity, and the resin temperature, at one of set screw positions and at set points in time elapsing from a start of injection, wherein said analyzing means obtains a dependency relation according to either an equation expressing the resin pressure using a power function of the injection velocity or the flow rate of resin, and an exponential function of the resin temperature.

18. (currently amended) A resin evaluation device using an injection molding machine according to claim 17, wherein said ~~analyzing means~~ analyzer is provided separately from the injection molding machine, and data of screw positions or points in time elapsing from a start of injection, data of resin temperature, data of injection velocity and data of resin pressure

obtained in the air shot injections of resin are inputted to said ~~analyzing means~~ analyzer.

19. (currently amended) A resin evaluation device using an injection molding machine according to claim 17, wherein said ~~analyzing means~~ analyzer is provided separately from the injection molding machine, and the data of injection velocity, the data of resin temperature, the data of detected values of the resin temperature at set screw positions or at set points in time elapsing from a start of injection are inputted to the ~~analyzing means~~ analyzer.

20. (currently amended) A resin evaluation device using an injection molding machine according to claim 17, ~~wherein said detecting means includes~~ further comprising:  
a pressure sensor provided at a nozzle of the injection molding machine or a pressure sensor for detecting resin pressure applied to the screw.

21. (currently amended) A resin evaluation device using an injection molding machine according to claim 17, wherein the resin temperature ~~condition~~ is represented by a nozzle temperature or a cylinder temperature.

22. (currently amended) A resin evaluation device using an injection molding machine comprising:  
~~setting means for setting analysis conditions including an injection velocity and a resin temperature to evaluate characteristics of resin;~~  
~~detecting means for detecting resin pressure at set screw positions or set points in time elapsing from a start of the injections under the set conditions; and~~  
one or more nozzles through which a first predetermined number of air shot injections of molten resin are performed with constant injection velocity and different values of resin temperature automatically altered successively for the respective air shot injections, and with resin pressure and injection screw position, or resin pressure and injection time elapsed from start of the injection as the injection screw is advanced, being measured for the respective air shot injections, and through which a second predetermined number of air shot injections of molten resin are performed with constant resin temperature and different values of injection velocity automatically altered successively for the respective air shot injections, and with resin pressure and injection screw position, or resin pressure and injection time elapsed from start of the injection as the screw is advanced, being measured for the respective air shot injections;  
and

~~analyzing means for an analyzer to evaluate characteristics of the molten resin by automatically obtaining an interdependency relation of variation between the resin pressure in the air shot injections with respect to the resin temperature and an injection velocity or a flow rate of resin based on the detected resin pressure, the injection velocity and the resin temperature at one of set screw positions and at set points in time elapsing from a start of each injection, wherein said analyzing means obtains the interdependency relation according to an equation expressing the resin pressure using a power function of the injection velocity or the flow rate of resin, and an exponential function of the resin temperature.~~

23. (currently amended) A resin evaluation device using an injection molding machine according to claim 22, wherein said ~~analyzing means~~ analyzer is provided separately from the injection molding machine, and data of screw positions or points in time elapsing from a start of injection, data of resin temperature, data of injection velocity and data of resin pressure are inputted to said ~~analyzing means~~ analyzer.

24. (currently amended) A resin evaluation device using an injection molding machine according to claim 22, wherein said ~~analyzing means~~ analyzer is provided separately from the injection molding machine, and the data of injection velocity, the data of resin temperature, the data of detected values of the resin temperature at set screw positions or at set points in time elapsing from a start of injection are inputted to the ~~analysis means~~ analyzer.

25. (cancelled)

26. (currently amended) A resin evaluation device using an injection molding machine according to claim 22, ~~wherein said detecting means includes~~ further comprising:  
a pressure sensor provided at a nozzle of the injection molding machine or a pressure sensor for detecting resin pressure applied to the screw.

27. (currently amended) A resin evaluation device using an injection molding machine according to claim 22, wherein the resin temperature ~~condition~~ is represented by a nozzle temperature or a cylinder temperature.

28. (previously presented) A resin evaluation device using an injection molding machine comprising:

~~control means for controlling a controller to control~~ the injection molding machine to successively perform a plurality of air shot injections of molten resin at different injection velocities set for each of set different resin temperatures;

~~detecting means for detecting a detector to detect~~ a resin pressure in each of the air shot injections;

~~storing means for storing a storage to store~~ a set of the resin temperature, an injection velocity and a resin pressure in each of the air shot injections;

~~analyzing means for analyzing an analyzer to analyze an~~ interdependency relation of variation of the resin pressure in the air shot injections with respect to the resin temperature and the injection velocity or a flow rate of resin based on data stored in said ~~storing means~~ storage, wherein said ~~analyzing means~~ obtains the interdependency relation according to an equation expressing the resin pressure using a power function of the injection velocity or the flow rate of resin, and an exponential function of the resin temperature.

29. (currently amended) A resin evaluation device using an injection molding machine according to claim 28, wherein said ~~detecting means~~ detector detects an injection pressure and ~~the~~ a screw position at every predetermined time period in each of the injections, said ~~storing means~~ storage stores the screw position, and said ~~analyzing means~~ analyzer obtains the interdependency relation as a function of the screw position.

30. (currently amended) A resin evaluation device using an injection molding machine according to claim 29, further comprising ~~display means for displaying a display to~~ display at least one of the relationship between the injection pressure and the injection velocity or the flow rate of resin, and the relationship between the injection pressure and the resin pressure as a function of the screw position based on the obtained interdependency relation.

31. (currently amended) A resin evaluation device using an injection molding machine according to claim 28, wherein said ~~detecting means~~ detector detects the injection pressure at set screw positions or set points in time elapsing from a start of each injection.

32. (currently amended) A resin evaluation device using an injection molding machine according to claim 28, further comprising ~~display means for displaying a display to~~ display at least one of the relationship between the injection pressure and the injection velocity or the flow rate of resin, and the relationship between the injection pressure and the resin



temperature based on the obtained interdependency relation.

33. (currently amended) An apparatus for evaluating resin ~~for using~~ an injection molding machine according to claim 28, further comprising ~~storing means for storing an interdependency storage to store the~~ interdependency relation of the resin pressure with respect to the resin temperature and the injection velocity or the flow rate of resin for each kind of resin, and ~~display means for displaying a display to display~~ a graph based on the stored interdependency relation for a designated kind of resin.

34. (cancelled)

35. (currently amended) A resin evaluation device using an injection molding machine according to claim 28, wherein said ~~detecting means~~ detector includes a pressure sensor provided at a nozzle of the injection molding machine or a pressure sensor for detecting resin pressure applied to the screw.

36. (currently amended) A resin evaluation device using an injection molding machine according to claim 28, wherein the resin temperature ~~condition~~ is represented by a nozzle temperature or a cylinder temperature.

37. (new) A resin evaluation method using an injection molding machine according to claim 5, wherein said interdependency relation is obtained according to an equation expressing the resin pressure using a power function of the injection velocity or the flow rate of resin, and an exponential function of the resin temperature.

38. (new) A resin evaluation device using an injection molding machine according to claim 22, wherein said analyzer obtains the interdependency relation according to an equation expressing the resin pressure using a power function of the injection velocity or the flow rate of resin, and an exponential function of the resin pressure.

39. (new) A resin evaluation device using an injection molding machine according to claim 28, wherein said analyzer obtains the interdependency relation according to an equation expressing the resin pressure using a power function of the injection velocity or the flow rate of resin, and an exponential function of the resin pressure.